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Claim Amendments For Examiner's Amendment

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METHOD, SYSTEM, AND COMPUTER PROGRAM PRODUCT FOR REPRESENTING AND CONNECTING AN
UNDERLYING CONNECTION-ORIENTED DEVICE IN A KNOWN FORMAT

The following changes are authorized to be made by Examiner's Amendment, as authorized by Jens Jenkins, Reg. No. 44,803, Applicant's Representative, to place the application in immediate condition for allowance. Unamended versions of some of the claims will be pursued in a related continuation for full prosecution.

Authorized herewith by Jens C. Jenkins 44,803 on March 31, 2005. A signed copy of this document will be sent by Fax. _[signature] March 31, 2005_
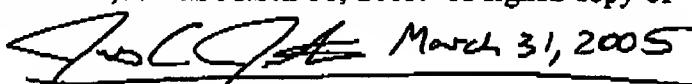
   1.   (Currently Amended) A method for representing to an application the characteristics of an underlying connection-oriented device through an integrating component, over known application-level interfaces of the integrating component, and allowing an application to take advantage of a connection-oriented I/O subsystem having the integrating component, over the known application-level interfaces, and without requiring the application programmer to program directly to the integrating component, the method comprising:

   representing to an application, over a first known application-level interface of the integrating component, the connection control characteristics of the underlying connection-oriented device related to the manner in which the connection-oriented device makes a connection for sending and receiving network data over a network, wherein the integrating component is positioned between the application and a connection-oriented device driver associated with the connection-oriented device and one or more data transport components;

   representing to the application, over a second known application-level interface of the integrating component, the data and data control characteristics of the underlying connection-oriented device;

   receiving, by the integrating component, a command from the application over the first known application-level interface that comprises a connection creation command, and wherein the computer-executable instructions operate to perform the following:
      interacting with the integrating component to create the connection;
      receiving a redirection command to send data and data control information received over the connection to a designated data transport of the one or more data transports;
      causing redirection of data and data control information from the previously created connection to the designated transport; and

returning to the application an identifier to be used by the application for receiving data and data control information from the designated transport;

receiving, by the integrating component, a command from the application over the second known application-level interface; and

by the connection-oriented device driver, interacting with the integrating component in order to execute said received commands so that the application may take advantage of the connection-oriented I/O subsystem and use the connection-oriented device using the known application-level interfaces and without requiring the application programmer to program to an interface of the connection-oriented device driver.

2.   (Previously Presented) A-The method as recited in claim 1 wherein the integrating component has a connection interface for making connections with underlying connection-oriented devices, and a data transport interface for interacting with the one or more data transport components, the method further comprising the steps of:

the one or more data transport components interacting with applications and the data transport interface;

sending, to the integrating component, instructions for directing data and data control information over a specified one of the data transport components; and

receiving, from the integrating component, an identifier that can be used by the application to access the data over the specified data transport component.

3.   (Previously Presented) A-The method as recited in claim 2 wherein:

the integrating component implements a connection manager interface that may support a connection manager component and the one or more data transport components interact with the integrating component over the connection manager interface to effectively register their respective data types; and

the method further comprises the steps of:

receiving from the integrating component a redirection command specifying a data type; and

interacting over the connection manager interface of the integrating component in order to determine a correct data transport component based on data type.

4.   (Cancelled).

5.   (Currently Amended) A connection-oriented driver subsystem where connection control information is communicated to an application through a connection interface while data and data control information is communicated through a connection-oriented transport interface, the driver subsystem comprising:

a connection-oriented device driver controlling a connection-oriented hardware device;

a data transport capable of communication with an application;

an integrating component that interfaces with the connection-oriented device driver and the data transport, said connection-oriented device driver and said data transport serving as clients to said integrating component, wherein said integrating component is positioned between the application, the connection-oriented device driver, and the data transport, said integrating component including:

abstracted connection interface that is available to a client that allows the client to create a connection with a desired location using the connection-oriented hardware device; and

a connection-oriented transport interface for interfacing with the data transport and for associating the connection with the data transport, thereby allowing the client to send and receive data and data control information over the connection; and

a proxy client component that interfaces with the abstracted connection interface and the connection-oriented transport interface of the integrating component as a client, said proxy client component being configured to:

receive abstract connection creation commands and abstract connection control commands from the application and to implement said commands through use of the <u>abstracted</u> connection interface to create and manage the connection;

cause redirection of data and data control information from the connection through the proxy client component to a designated data transport designated in one of the abstract connection control commands; and

return to the application, in response to a previously received connection control command, an identifier to be used by the application for receiving data and data control information from the designated data transport so that the connection control information can be communicated to the application through the proxy client component while the data and data control information is communicated to the application through the designated data transport.

6.   (Original) A-The subsystem as recited in claim 5 wherein the integrating component is incorporated as part of an operating system.

7.   (Currently Amended) A computer program product for interacting with known application-level interfaces of an integrating component of a connection-oriented I/O subsystem in order to represent the characteristics of an underlying connection-oriented device to an application and allow an application to take advantage of the connection-oriented I/O subsystem over the known application-level interfaces of the integrating component without requiring the application programmer to program to a new interface, said computer program product comprising:

a computer-readable medium; and

computer-executable instructions carried on said computer-readable medium for performing the steps of:

representing to an application, over a first known application-level interface of the integrating component, the connection control characteristics of the underlying connection-oriented device related to the manner in which the connection-oriented device makes a connection for sending and receiving network data over a network, wherein the integrating component is positioned between the application, a connection-oriented device driver associated with the connection-oriented device, and one or more data transports;

representing the data and data control characteristics of the underlying connection-oriented device to the application over a second known application level interface of the integrating component;

receiving, by the integrating component, a command from the application over the first known application-level interface that comprises a connection creation command, and wherein the computer-executable instructions operate to perform the following:

interacting with the integrating component to create the connection;

receiving a redirection command to send data and data control information received over the connection to a designated data transport of the one or more data transports;

causing redirection of data and data control information from the previously created connection to the designated transport; and

returning to the application an identifier to be used by the application for receiving data and data control information from the designated transport;

receiving, by the integrating component, a command from the application in the second known application-level interface; and

by the connection-oriented device driver, interacting with the integrating component to execute said received commands.

8.   (Cancelled).

9.   (Original) A The computer program product as recited in claim 8 7, wherein the data redirection takes place in the integrating component.

10.   (Previously Presented) A method for representing to an application the characteristics of an underlying connection-oriented device over known application-level interfaces of an integrating component and allowing an application to take advantage of a connection-oriented I/O subsystem having the integrating component, over the known application-level interfaces, and without requiring the application programmer to program directly to the integrating component, the method comprising:

separating connection control characteristics from data and data control characteristics received from an underlying connection-oriented device;

representing to an application, over a first known application-level interface of the integrating component, the connection control characteristics of the underlying connection-oriented device related to the manner in which the connection-oriented device makes a connection for sending and receiving network data over a network, wherein the integrating component is positioned between the application, a connection-oriented device driver associated with the connection-oriented device, and one or more data transport components;

representing to the application, over a second known application-level interface of the integrating component, the data and data control characteristics of the underlying connection-oriented device;

receiving, by the integrating component, a command from the application over the first known application-level interface that comprises a connection creation command, and wherein the computer-executable instructions operate to perform the following:

interacting with the integrating component to create the connection;

receiving a redirection command to send data and data control information received over the connection to a designated data transport of the one or more data transports;

causing redirection of data and data control information from the previously created connection to the designated transport; and

returning to the application an identifier to be used by the application for receiving data and data control information from the designated transport;

receiving, by the integrating component, a command from the application over the second known application-level interface; and

by the connection-oriented device driver, interacting with the integrating component in order to execute said received commands so that the application may take advantage of the connection-oriented I/O subsystem and use the connection-oriented device using the known application-level interfaces and without requiring the application programmer to program to an interface of the connection-oriented device driver.

11.   (Previously Presented) A-The method as recited in claim 10 wherein the integrating component has a connection interface for making connections with underlying connection-oriented devices, and a data transport interface for interacting with the one or more data transport components, the method further comprising the steps of:

the one or more data transport components interacting with applications and the data transport interface;

sending, to the integrating component, instructions for directing data and data control information over a specified one of the data transport components; and

receiving, from the integrating component, an identifier that can be used by the application to access the data over the specified data transport component.

12.   (Previously Presented) A-The method as recited in claim 11 wherein:

the integrating component implements a connection manager interface that may support a connection manager component, and

the one or more data transport components interact with the integrating component over the connection manager interface to effectively register their respective data types; and

the method further comprises the steps of:

receiving from the integrating component a redirection command specifying a data type; and

interacting over the connection manager interface of the integrating component in order to determine a   correct data transport component based on data type.

13.   (Original)   A computer program product comprising one or more computer-readable medium having computer-executable instructions for performing a method for representing to an application the characteristics of an underlying connection-oriented device over known application-level interfaces of an integrating component and allowing an application to take advantage of a connection-oriented I/O subsystem having the integrating component, over the known application-level interfaces, and without requiring the application programmer to program directly to the integrating component, the method comprising:

separating connection control characteristics from data and data control characteristics received from an underlying connection-oriented device;

representing to an application, over a first known application-level interface of the integrating component, the connection control characteristics of the underlying connection-oriented device related to the manner in which the connection-oriented device makes a connection for sending and receiving network data over a network, wherein the integrating component is positioned between the application, a connection-oriented device driver associated with the connection-oriented device, and one or more data transport components;

representing to the application, over a second known application-level interface of the integrating component, the data and data control characteristics of the underlying connection-oriented device;

receiving, by the integrating component, a command from the application over the first known application-level interface that comprises a connection creation command, and wherein the computer-executable instructions operate to perform the following:

interacting with the integrating component to create the connection;

receiving a redirection command to send data and data control information received over the connection to a designated data transport of the one or more data transports;

causing redirection of data and data control information from the previously created connection to the designated transport; and

returning to the application an identifier to be used by the application for receiving data and data control information from the designated transport;

receiving, by the integrating component, a command from the application over the second known application-level interface; and

by the connection-oriented device driver, interacting with the integrating component in order to execute said received commands so that the application may take advantage of the connection-oriented I/O subsystem and use the connection-oriented device using the known application-level interfaces and without requiring the application programmer to program to an interface of the connection-oriented device driver

~~the steps recited in claim 10.~~